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By-Mahan, Thomas W.

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Under Project Concern minority group children in Hartford, Conn., were bused to 33 elementary schools in five suburban school systems. The goals were to change the de facto desegregation of the inner city schools, to design an effective, supportive educational intervention program to arrest and remediate school failure, and to evaluate the effectiveness of the experiment. The project design involved four groups--(1) bused students receiving supportive services in the suburban schools, (2) bused students receiving no support, (3) nonbused students receiving support- in their inner city schools, and (4) nonbused students receiving no support. There were gaps in the data collection process which seriously limited the interpretation of the findings. However, the bused students showed regular attendance, persistence in school placement, and participation in extracurricular activities. The suburban teachers found them responsive to high academic expectations and able to adjust quickly. No increased anxiety or higher incidence of emotional or behavior problems or of school failure was found among the experimental pupils. The project "seems to work," and there will be further evaluation to quantitatively assess the findings. (NH)

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PROJECT CONCERN

An Interim Report on an Educational Exploration

Preliminary Report

UD 006 418

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Thomas W. Mahan, Ph. D.
Director, Project Concern

Hartford, Connecticut September, 1967

> Life must be lived forwards, but can
> only be understood backwards.
> Kierkegaard

ACKNOWLEDGMENTS

This report is an attempt to gain an ordered and meaningful glimpse into what Project Concern has meant during the past year. It cannot be read as more than a preliminary glimpse which may be transitory or out of perspective as final data become available. Nonetheless, it may provide insights and suggestions for those who must live in the present as well as in the future.

The preparation of this report has been possible only because so many have been so willing to guide, assist and work. Most directly the counsel of Dr. David V. Tiedeman of Harvard University has relieved the bleakness of many days while the dedicated and brilliant statistical assistance of Dr. John H. Noble has provided backbone to the report and strength to the writer. In less dramatic fashion, but with yeoman effort in a time of crisis the entire central office staff of Project Concern has performed in devoted and unforgettable fashion. To each of these I express profound and humble gratitude.

But my gratitude is even deeper for the children and their parents who dared to walk this avenue with us. Their faith and hope gave life to an experiment, creating from it an exploration of the possibilities of human development. This faith and hope found reverberation in the school administrators and teachers in the suburban towns who took on this new challenge with enthusiasm coupled with realism.

The following pages try to indicate what all these human emotions have meant; they inevitably fail. They do, however, stand as a rather barren but significant witness as to what is possible when people are willing to be so reckless as to have "the courage to dream".

Hartford, Connecticut
September, 1967

in a 296 page report entitled Evaluation 1965-66 Project 64-1 (Hartford Public Schools, 1966). Yet the haunting feeling remained that the educational lot of these North End youngsters was less than equal and that equalization of educational opportunity would be a massive task. Buildings had been renovated; class sizes had been reduced; teacher qualifications had been improved; special media and facilities were creating storage problems. Through all this the phenomenon described by Deutsch (1964) as "cumulative deficit" seemed to lurk. The youngsters in Hartford's North End schools, like the youngsters in inner city schools throughout the country, appeared to fall further behind expectations for mental development and school achievement the longer they stayed in school.

This pattern was not changing perceptibly and the old, easy answers were becoming unacceptable. The cry that the measures were socially and racially biased had a false ring in spite of its obvious truth. Biased as they were, they remained relatively good predictors of an individual's possibilities for "making it" in the society and recent economic, technological developments raised serious doubts about studies done some twenty years ago about the ability of the economic world to assimilate in effective fashion the school failure. The same kind of skepticism had to be shown toward the hypothesis that the cumulative records of these children reflected in adequate fashion the limits of their educability. There was too much evidence of the ability of these children to learn - even of their learning how not to learn what the school taught - to dismiss them as uneducable.

The issue could be simply posed: how does a city provide an educationally stimulating environment for that large proportion of its youth who come with existing or incipient learning disabilities? Is it possible to create such an environment within the neighborhood school where the large majority of the pupils are likely to fall into such classifications or is a new structural pattern needed? This question was posed very directly to the City of Hartford in a study done by the Center for Field Studies of the Harvard Graduate School of Education under the direction of the late Dr. Vincent Conroy. That report, jointly sponsored by the Hartford Board of Education and the Hartford City Council, suggested that some form of metropolitan cooperation would be required to create equal and effective education for Hartford's less affluent. This was a dramatic departure from the compensatory education route and one that had strong emotional and political overtones as well as the obvious educational ones.

> A reaction which combines features of both neurosis and psychosis is the one we call normal or "healthy"; it denies reality as little as neurosis, but then, like a psychosis, is concerned with effecting a change in it.
>
> Freud

CHAPTER I

Historical Overview

On September 4, 1966 a controversy that had raged for seven months in the greater Hartford area was translated into a political reality. At 7:30 a.m. eight yellow school busses began winding their way through the so-called "North End" to transport youngsters, mostly Negro (88%), some Puerto-Rican (10%) and a few white (2%) to public elementary schools in some of Hartford's most affluent suburbs. The presence of national news media representatives was clear evidence that this day had not come easily and that it had implications far beyond the simple issue of school transportation. To move 266 youngsters by bus to schools which were up to twenty-five miles from their homes was no major task; to move 266 youngsters, mostly non-white and all from the disadvantaged area of Hartford, into educationally autonomous suburbia was no mean achievement and it had come about only after profound soul searching and hard work.

The problem was a simple one. Hartford found itself suddenly confronted with an elementary school population which was 54% non-white (44% Negro; 10% Puerto-Rican) in 1965. This percentage of non-white pupils exceeded that found in most of the major northeastern cities. But even these figures failed to tell the full story. Of the 11,000 non-white youngsters in kindergarten through grade eight over 9,000 were in the eight schools which were at least 85% non-white in total enrollment. In other words, de facto segregation had come to Hartford with a vengeance to the point where a large elementary school of over 1700 pupils was better than 99% non-white.

Hartford had not been unaware of the problem. Two of its most recent school building ventures had been directed to this critical issue. Prior to passage of the Connecticut State Act for Disadvantaged Children and of Title I of The Elementary and Secondary Education Act Hartford had embarked on modified "higher horizons" and related compensatory programs. With the additional resources provided by the legislation mentioned above all of the segregated schools became involved in an ever-broadening series of programs described

The Planning of an Experiment

Slowly the concept began to take on the reality of an experimental exploration known now as Project Concern. The path from idea to reality was painful and it was completed essentially because of courageous laymen and schoolmen who wanted to find answers. This report is not the place to detail the vehemence of public hearings, the courage of board of education members and school administrators, and the vigorous support from varied segments of the power structure. As the process evolved the Hartford Board of Education indicated its willingness to cooperate; the Connecticut State Department of Education served as intermediary in terms of exploring with suburban towns their willingness to participate while also seeking financial support from the government; five local boards of education (Farmington; Manchester; Simsbury; South Windsor; West Hartford) voted to collaborate on a two-year experimental basis while one (Glastonbury) declined.

Critical to the development was an orientation rather unique in educational change. The voices of support were many, but among the most important were those that insisted that the program be designed to provide answers - that an experimental approach with a careful design be employed to provide a basis for development or abandonment beyond faith and goodwill. American public education has not generally followed this line; traditionally changes are effected upon an a priori basis with an implicit assumption that they must be good because they seem so - or someone says that they are. From such reasoning have evolved special classes, enrichment programs, new math and science curricula, new approaches such as adaptations of the Montessori methodology or the initial teaching alphabet. Many of these have been highly desirable changes, but their impact and extent of effectiveness have rarely been objectively assessed.

The detail of the design and its limitations will be spelled out in the next chapter of this report. Still, it is important to make clear that this report tries to assess on an interim basis the present effectiveness of an educational intervention. Project Concern is basically an exploration of the relative impact of varying educational treatments upon the educational development of youngsters drawn from a situation where the incidence of school failure is extremely high. As such it is interested in a number of related issues which touch on social values, integration and personality development. These areas will receive scant attention in this report, but will be more fully treated in subsequent reports. In similar fashion, the logistic feasibility of the Project will be only briefly mentioned. Most of the questions related to that issue were resolved by an imaginative experiment conducted by the West Hartford Public Schools in conjunction with their summer school in July-August, 1966. This experiment, funded under the Office of Economic Opportunity, is reported fully in a document entitled An Experiment in Urban-Suburban Education (West Hartford Public Schools, 1967). The major conclusions of that report are as follows:

1. Poverty area parents appear to accept the idea of urban-suburban mixing.
2. Neither bus schedules nor bus behavior create major obstacles to such programs.
3. Attendance at a summer school was essentially the same in terms of absence and drop-out rates for both urban and suburban children.
4. There was no evidence of psychological or cultural blocks to learning among urban children bussed to a suburban school.
5. Suburban teaching staff did not report greater difficulty in teaching urban children.

These findings point clearly to the feasibility of urban-suburban programs, but leave unanswered the critical questions about the influence of such programs on learning and cognitive development as well as on the more difficult to assess issues such as attitudes and values.

What Is Success?

Interrelated with the question of whether Project Concern works are two other questions: what are the criteria of success; what are the bases for the success? Some comment on each of these is appropriate before detailing the procedures and design.

Success can obviously be defined in a number of ways and will inevitably reflect the perspective of the definer. In this interim report the assumption is made that a critical, perhaps essential aspect of success is measurable, systematic change, associated with the intervention, on evaluation instruments with high predictive validity for future school performance. Certainly teacher evaluation, perception and reports are of importance as are such inferred indices as motivation and interest. Yet the pay-off from the latter should be seen in the former. For this reason it is again important to stress that this is an interim report and that changes such as those reported by teachers may require more time for translation into action defined as objectively measured achievement.

The "whys" of success cannot be intelligently discussed before the results are critically presented and examined except insofar as it is important to give some insight into the rationale of the experiment. It is unlikely that a forty-five minute bus ride or an educational setting surrounded by a larger number of trees and more square feet of grass will make a significant difference in school performance. At the same time it is difficult to extract from a complex, interacting system which are the truly relevant aspects of an intervention. In theory, Project Concern is built upon the following basic assumptions:

1. response patterns are most likely to change where the environmental conditions (physical, psychological and social) are markedly different from those typically encountered;
2. as old response patterns are discarded the evolving new patterns will develop in the direction of models presented provided that such models do not create disabling anxiety or pose unattainable goals.

The next chapter will describe how these assumptions were translated into experimental procedures and subsequent sections will attempt to evaluate the relevance of the assumptions.

Outline of This Report

The remainder of this report is dedicated to presenting in concise, honest, naked fashion a description of the program as it functioned and the results of the interim evaluation analysis. Chapter II describes the experimental design, the nature of the different interventions, the data collection and analysis procedures, and the limitations of this report. Chapter III presents on a grade by grade basis the significant findings on the major criteria: cognitive functioning and school skills. Chapter IV is concerned with data drawn from attendance records, teacher reports and personality evaluation. Chapter V evaluates the data in terms of school differences and sketches the framework for assessing the theoretical assumptions stated above. Chapter VI summarizes the findings, clarifies the limitations of this report while it also outlines the broader perspective for the final report. Following Chapter VI are a number of appendices which provide more detailed technical information.

> He is not a man of science who does not
> bring some sympathy to his studies, and
> expect to learn something by behavior
> as well as by application.
>
> Thoreau

CHAPTER II

Implementation and Design

The decision that Project Concern should not be just a demonstration, but should be also an experimental study designed to provide answers as well as illustrate techniques brought with it all of the problems that confront applied research in the "real world" setting. The control and manipulation of variables so easily accomplished in the laboratory can only be approximated in the daily world - and even these approximations are difficult to protect within the constraints of respect for human choices and finances. With full recognition of these problems it was agreed that the basic question which demanded an answer was: can the typical youngster from the North End schools benefit educationally from attendance in a suburban school? There seemed little doubt that selected youngsters who had shown academic promise could develop more quickly in an environment that provided more challenge and encouragement, but what about the youngster who had shown little or no educational initiative?

Selection of Subjects

Since this question seemed so fundamental to the practicality of the model for large scale implementation the entire population of Hartford's racially imbalanced, disadvantaged schools had to have equal chance for participation. In reality, the population to be studied was operationally defined in the following manner:

1. They must be entering grades k-5 in September, 1966;
2. They must be enrolled in a school in the North End which is at least 85% non-white in population;
3. They must not have a recorded IQ which makes them eligible for special class placement (below 80 IQ).

With these three criteria establishing the available population a sample of a size determined by space made available by the five suburban communities was to be randomly selected. Ideally, this random selection would have been on a child by child basis. Practical considerations dictated a compromise and intact classes were randomly selected from the eight eligible schools by use of a table of random numbers. This compromise made it possible for the City of Hartford to free a teacher for every class (25 or so youngsters) selected who could then be assigned to a supportive team to be described below.

The actual selection of classes of experimental subjects came by chance from five of the eligible schools with the two schools generally considered most disadvantaged contributing 40% of the experimental sample. A control group was then selected in a somewhat stratified fashion. Randomness was now restricted to the extent that controls at a given grade level must be drawn from the same school or schools from which the experimentals had come. The intent here was to combine certain aspects of a matched group with some degree of randomness.

There remained one further problem in this selection procedure. The controls could be selected in this predetermined fashion without further consultation. Experimental subjects, however, could not suddenly be transported to out-Of-city schools without parental consent. Any large number of parental refusals could introduce a contamination of unknown magnitude into the experiment. Many had warned that such refusals were to be expected and that, indeed, it might be difficult to find 250 to 300 families who would participate without drawing heavily from the Negro middle class. These fears proved unwarranted; the five communities provided 266 spaces and 300 names had been selected by the process described above. Of these 300, twelve families declined to participate and others were randomly omitted to reduce the sample size to 266. This 96% parental acceptance seemed more than adequate to avoid any systematic bias in the sample selection. Table I indicates the relative performance of experimental and control groups on some of the pre-test measures administered in the Fall, 1966.

TABLE I

Comparative Performance of Experimental and Control Subjects on Selected Pretest Measures

	Experimental	Control
WISC Verbal IQ	91.12	91.70
PMA Verbal (Raw Score)	35.25	37.33
PMA Numerical (Raw Score)	13.50	17.13

These data suggest that there was no bias in favor of the experimental group in the selection process. They do indicate the possibility of some systematic differences between the groups and underline the need for the use of covariate adjustors in the statistical analysis of post-test scores.

Table II indicates the breakdown by grade and sex of the Experimental Subjects while Table III gives the same breakdown for the Control Subjects.

TABLE II

Frequency by Grade and Sex of Experimental Subjects

	Kdg	1	2	3	4	5	Total
Male	23	27	30	21	18	23	142
Female	25	23	21	13	16	26	124
TOTAL	48	50	51	34	34	49	266

TABLE III

Frequency by Grade and Sex of Control Subjects

	Kdg	1	2	3	4	5	Total
Male	32	19	18	27	23	16	135
Female	22	27	21	35	32	31	168
TOTAL	54	46	39	62	55	47	303

The most striking difference in these two tables is the disparity in sex distribution. While the experimental group is composed of 53% males, the control group is made up of 45% males. This difference, along with the research which continues to emphasize sex as a major variable, points up the need to study the effect of sex on the results both as an independent and as an interacting source of variance.

The Four Cell Treatment Design

As the initial concept of Project Concern took on concrete form a new issue, alluded to above, arose. It was clear that North End youngsters would be at an academic disadvantage in suburbia and the fear that the disadvantage could be psychologically crippling was voiced. At the same time, from some suburban sources came the worry that the Hartford children's disabilities would place a demand on the teacher that would work to the detriment of the suburban children in the classroom. To meet these concerns the idea of the "supportive team" was developed. This team, made up of a professional teacher provided by Hartford but to be deployed by the suburban school at their discretion and a para-professional aide indigenous to the North End, would accompany each twenty-five experimental youngsters. The assumption was that the local school, through a number of different possible avenues, could then meet the remedial needs of experimental youngsters, maintain better home-school contact, and also provide a bonus to the local school population in terms of added staff time and talent.

While this concept won quick acceptance in most of the involved communities, it also introduced a new contamination into the research design. The question was no longer: will suburban educational opportunities create greater developmental stimulus than the urban educational environment? Rather, it now read: will suburban educational opportunities accompanied by supportive instructional assistance beyond that usually available create greater development than the urban school? This could well be read as a stacking of the cards; at the least, it presented the problem of being able to distinguish whether suburban placement, in and of itself, could be an effective intervention.

To meet the crises created by this complication two steps were taken. The West Hartford Public Schools agreed - in fact, insisted - that half of its experimental subjects be placed in its schools without the benefit of the supportive team. The West Hartford officials also raised the question with the Research Consultants for the Project as to whether or not a fourth cell of non-bussed youngsters remaining in Hartford who received the assistance of a supportive team might not be required to balance the design and permit inferences about the relative impact of urban-suburban mixing versus supportive assistance.

This problem underlined the many difficulties involved in defining the treatments. How homogeneous a concept is "suburban school" when this describes five different school systems, thirty-three different schools, and 124 different classrooms? In similar fashion, how homogeneous is the concept of "inner city school", particularly with the differential expenditure of increasing amounts of State and Federal monies for enriching and compensatory experiences. These are unanswerable questions and an assumption is made of some distinctive differences between suburban schools and inner city schools.

The critical question, however, became one of defining the nature of the assistance to be provided by the supportive team. Although the role was defined in varied fashion in the five communities (from having the teacher serve as a regular classroom teacher so as to free other teachers to work with small groups to a roving remedial instructor), certain commonalties of function appeared:

1. increased availability of remedial assistance for pupils who needed it (both experimental and suburban pupils);
2. close contact with the home;
3. close liaison with special services such as social work and psychology;
4. provision of new resource materials for teachers dealing with culturally different children.

These services, although focused on the twenty-five experimental youngsters, were available to a population (K-5) that averaged over 1000 per supportive team.

Upon these bases an attempt was made to establish the equivalency of this treatment cell (non-bussed, but with supportive assistance) without actually assigning a similarly designed team. Rather, a North End school with special personnel resources was utilized and an agreement reached with the school administration that the control youngsters selected from there (1-5 and included in Table 3 above) would receive all of the services spelled out in the prior paragraph. A periodic check was made to see that the services were indeed provided.

Once again necessity compelled compromises with the research ideal. Table 4 makes more striking the extent of the compromise by underlining the smallness of Cell 3 (bussed, without supportive team) for a grade by sex analysis. This is probably a more serious problem than the non-identity of the supportive program since there is adequate evidence that youngsters in Cell 2 did receive supportive assistance beyond that which could be ordinarily expected.

TABLE 4

Frequency by Grade and Sex of Four Cells

	Cell 1		Cell 2		Cell 3		Cell 4	
	(Non-bussed; Non-Supported)		(Non-bussed; Supported)		(Bussed; Non-Supported)		(Bussed; Supported)	
	Male	Female	Male	Female	Male	Female	Male	Female
Kdg	32	22	0	0	4	6	16	17
1	5	13	14	14	6	5	18	16
2	8	11	10	10	2	3	24	16
3	21	26	6	9	4	2	15	9
4	19	24	4	8	4	2	13	13
5	11	20	5	11	2	3	19	23

Two aspects of Table 4 require some comment. The first is the lack of kindergarten subjects in Cell 2. This was a deliberate decision based upon the assumption that special supportive services (instructional in nature) would be inappropriate at this level. The second item is the discrepancy between Table 1 which shows a total of 266 experimental subjects and Table 4 where Cells 3 and 4 combine to total 242. This latter is based upon the subjects actually included in the end-of-first-year analysis. As a result, the fifteen drop-outs (see Chapter IV) are not included nor are the nine experimental subjects upon whom inadequate records were obtained (see further in this Chapter for explanation of this problem).

Data Collection

As a two-year experiment it became important to determine the time sequences for data collection. Since the final decisions about research design and analysis were the responsibility of a committee made up of two independent consultants (Dr. John Noble of Brandeis University; Dr. David Tiedeman of Harvard University), the coordinator of data collection (awarded on a contract basis for the first year to Dr. John Cawley of the University of Connecticut), and the Project Director, *ex officio*, this item fell under their jurisdiction. Four critical times were established for the evaluation procedure:

Fall, 1966 - baseline pretests
Spring, 1967 - end of first year progress tests
Fall, 1967 - impact of summer evaluation
Spring, 1968 - final post-test

This report is based upon the first two testing periods. In addition to these formal phases some evaluation materials were collected on a regular basis throughout the year (e.g., teacher reports on a weekly basis).

The domains which were decided upon for inclusion and the instruments to be used are summarized in Table 5.

TABLE 5

Evaluation Instruments Used by Grade

	Cognitive Functioning		School Skills		Personal-Social Development			
Grade	Wechsler Verbal Scale	Primary Mental Abilities	Metrop. Readiness	Iowa Basic Skills	Anxiety Scales	Sociometric	Occupational Aspiration	Creativity
Kdg	X	X	X				X	X
1	X	X	X		X		X	X
2	X	X			X	X	X	X
3	X	X		X	X	X	X	X
4	X	X		X	X	X	X	X
5	X	X		X	X	X	X	X

This interim report is devoted primarily to an analysis of the first two domains: cognitive functioning and school skills. Chapter IV will present some preliminary data on the area designated as "personal-social development" but much of this analysis has not been completed because of complexities in scoring.

The procedures used for data collection varied some as the Project evolved. In the Fall, 1966, testing all instruments were administered to the child in the school setting which he attended, some on an individual basis and others on a group basis determined by test manual instructions. This process had two disadvantages: it was uneconomical in time involvement for group testing; it raised the question of unconscious or conscious examiner bias in test administration in spite of the use of independent examiners. As a result, the Spring, 1967, group testing was accomplished by bringing experimental and control youngsters to a central spot on a grade by grade basis for testing with room assignments made such that controls and experimentals would be intermixed. The individual testing (WISC Verbal Scale; Occupational Aspiration) was done as before in the individual school to which the child was assigned.

Limitations of the Data

There are certain intrinsic limitations to any evaluation process which stem from less than perfect instruments and the need to recognize measurement errors as well as problems of instrument reliability and validity. These intrinsic limitations will be given more attention in Chapter III. Beyond these there are extrinsic limitations which can be attributed only to human error and the human condition. Most serious of these is the fact that a large percentage of the subjects were missed in the data gathering process because of such things as absence and inadequate checks and controls. This is particularly troublesome in terms of pre-test data and underlines the wisdom of the two-year experiment concept since this permits study of second year performance as an independent slice as well as in relation to year one. From Table 6 the extent of missing data can be inferred. The figures in this table emphasize the limitations which must be placed upon any interpretations and inferences in this interim report. The magnitude of the missing data has demanded certain statistical manipulations which bring with them dangers as well as advantages.

TABLE 6

Number of Subjects Administered Tests

	Total N	Pre WISC	Post WISC	Pre & Post WISC	Pre PMA	Post PMA	Both Pre & Post PMA	ACH
Grade 5								
Experimental	47	40	41	36	33	35	25	34
Control	47	31	44	29	44	45	43	43
Grade 4								
Experimental	32	31	29	28	25	25	19	27
Control	55	25	32	7	42	33	24	46
Grade 3								
Experimental	30	28	25	24	12	29	12	28
Control	62	31	56	29	42	55	38	51
Grade 2								
Experimental	48	44	40	38	34	37	27	-
Control	39	23	35	22	33	28	27	-
Grade 1								
Experimental	45	43	37	35	38	32	37	29
Control	47	30	34	26	35	38	26	41
Kdg								
Experimental	43	38	40	37	38	37	34	37
Control	54	36	45	30	21	49	19	45

Basic to the effort of reducing the probability of distortion because of missing data has been the study of inter-test correlations for the feasibility of establishing regression equations. Careful study and analysis have suggested that the fairest and least contaminating procedure is to derive a mean score for each treatment for each sex at every grade level and then assign this to the missing units. Over the total samples this appears a reasonable expedient which is not likely to introduce bias in any direction. However, the danger exists that individuals who form the basis for the mean score are not representative of the total cell sample. The most acute instance of this is seen among the fourth grade controls where only 7 youngsters received both pre- and post WISCS. For these youngsters the mean IQ's are 95.3 and scores on the pre-test are 92.2 for males and 87.8 for females while the values for the post-test are 106.2 for males and 101.8 for females. This variability raises the question about the comparability of the pre- and post-test samples where less than 13% of the two groups overlap. This is the most extreme case, but it clearly illustrates the tentativeness of the inferences contained in this report. Nonetheless, since the typical overlap exceeds 50% the procedure has been followed at all levels.

At the same time, this situation places in stark relief the need for precise and absolute control over the data collection in the second year of the Project. Only through such measures can the validity of the final conclusions be protected; these measures have been instituted as of this time. In the fall, 1967, data collection process weekly checks on each child's profile are made, missing test results are immediately obtained and it now appears that all data will be complete by October 15.

Data Analysis

The basic technique for data analysis has been a multivariate analysis program which determines the extent to which measured changes show a systematic relation to treatment procedure (the four cells), to sex, or to an interaction between treatment procedure and sex at each grade level while using certain covariate adjustors which, in essence, statistically remove the initial difference on pretest scores among subjects. In other words, the data analysis first by way of statistical manipulation places everybody at the same starting line and then proceeds to answer the following questions for each grade level:

1. did being assigned to a specific cell make a statistically significant difference in post-test scores on the measures of cognitive development and school skills;
2. did being either male or female make a statistically significant difference in post-test scores on the measures of cognitive development and school skills no matter which treatment cell was involved;
3. did being assigned to a specific cell combined with being either male or female make a statistically significant difference on these measures.

In the cases of the Wechsler Intelligence Scale for Children (Verbal Scale) and the Test of Primary Mental Abilities, the pre-test scores are used as the covariate adjustors so as to permit the assumption of original equivalence across sexes and cells. For the school skill measures (Metropolitan Readiness and Iowa Basic Skills) where pretests were not given the WISC Verbal IQ (pretest) is used as the covariate adjustor.

Summary

Chapter III attempts to gain some insights as to how the experiment has progressed during the initial year. It cannot be overemphasized that it constitutes the main body of an interim report and the discussion above about disparity in numbers in the treatment cells and the overly large attrition rate in data collection, must underscore the care that needs to be exercised as a caution against assigning success or failure when arguments could be made that the presence of significant results are a function of the so-called "Hawthorne effect" or that their absence is a function of inadequate opportunity for changes in intervening variables such as motivation or self-esteem to become translated into measurable achievement. Nonetheless, these interim results may point toward some general trends that deserve careful thought as well as critical watching.

On a huge hill,
Cragged and steep, Truth stands, and hee that will
Reach her, about must, and about must goe;
And what the hills suddenness resists, winne so.
Donne

CHAPTER III

Presentation of Results

This chapter presents the main burden of the first year's data. It indicates on a grade by grade basis the presence of a statistically significant impact (i.e., an impact of such magnitude that it would not be expected to arise by chance more than five times out of 100) of treatment, of sex, or of interaction between treatment and sex on the following criterion variables (the number in the parentheses following each variable indicates the correlation with its covariate adjustor indicated in Chapter II):

1) Cognitive Functioning

a) Wechsler Verbal Scale - All grades

Information subtest	(.809)
Comprehension subtest	(.661)
Arithmetic subtest	(.771)
Similarities subtest	(.650)
Vocabulary subtest	(.733)
Verbal IQ	(.671)

b) Primary Mental Abilities - Form 5-7; Kdg-2

Verbal	(.728)
Perceptual	(.394)
Quantitative	(.608)
Motor	(.487)
Spatial	(.356)

c) Primary Mental Abilities - Form 7-11, Grades 3-5

Verbal	(.713)
Spatial	(.461)
Reasoning	(.481)
Perceptual	(.309)
Numerical	(.500)

2) School Skills

a) Metropolitan Readiness Test - Kdg; Grade 1

Word Knowledge	(.358)
Listening	(.224)
Matching	(.224)
Alphabet	(.380)
Numbers	(.318)
Copying	(.255)
Total Score	(.495)

b) Iowa Basic Skills - Grades 3-5

Vocabulary	(.114)
Reading Comprehension	(.031)
Arithmetic Computation	(.068)

The information on this list is summarized in Table 7 showing the following number of criterion variables at each grade level.

TABLE 7

Number of Criterion Variables by Domain for Each Grade

Grade	Cognitive Functioning	School Skills
K	11	7
1	11	7
2	11	0
3	11	3
4	11	3
5	11	3

In addition, the list indicates a highly significant correlation between the criterion variable and the covariate adjustor except in three instances (all three subtests of the Iowa Basic Skills). The lack of any meaningful correlation between these subtests and a measure of verbal IQ is surprising and will require further comment as the data are presented. In the tests of cognitive functioning the correlations with covariate adjustors can also be read as test-retest (or stability) reliability coefficients. The size of these coefficients are such as to place considerable faith in the reliability of the measures. In similar fashion, the subtest intercorrelations on the five criterion variables presented in Tables 8-12 show that these relationships are consistent with those reported in the test manuals and the literature in spite of some depression in mean score and restriction in variability.

TABLE 8

Subtest Intercorrelations - Wechsler Post-Test

	Inf.	Comp.	Arith.	Sim.	Vocab.
Inf.		.705	.780	.737	.786
Comp.	.705		.652	.622	.664
Arith.	.780	.652		.666	.682
Sim.	.737	.622	.666		.736
Vocab.	.786	.664	.682	.736	
VIQ	.466	.452	.363	.490	.458

TABLE 9

Subtest Intercorrelations - PMA - (5-7) Post - Test

	Verbal	Perception	Quat.	Motor
Verbal		.697	.791	.528
Perception	.697		.727	.543
Quantitative	.791	.727		.525
Motor	.528	.543	.525	
Spatial	.665	.542	.749	.464

TABLE 10

Subtest Intercorrelations - PMA - (7-11) Post-Test

	Verbal	Spatial	Reasoning	Perception
Verbal		.474	.529	.292
Spatial	.474		.557	.408
Reasoning	.529	.557		.421
Perception	.292	.408	.421	
Numerical	.430	.287	.373	.504

TABLE 11

Subtest Intercorrelations - Metropolitan Readiness

	Word Kn.	Listening	Match	Alph.	Num.	Copy
Word Knowledge		.216	.483	.291	.375	.096
Listening	.216		.412	.667	.342	.636
Matching	.483	.412		.404	.495	.159
Alphabet	.291	.667	.404		.380	.812
Numbers	.375	.342	.495	.380		.149
Copying	.096	.635	.159	.812	.149	
Total	.665	.687	.759	.880	.654	.760

TABLE 12

Subtest Intercorrelations - Iowa Basic Skills

	Vocabulary	Reading
Vocabulary		.839
Reading Comprehension	.839	
Arithmetic Computation	.877	.820

In other words, the internal evidence on these variables appears to justify their use as readonably stable and consistent measures for assessing change in performance on the samples in the study. The correlations across tests (reported in the Appendices) and among subtests also indicate that there is sufficient commonalty among the measures to see them as all related to the inferred criterion of school aptitude but with adequate homogeneity to allow for differentiation among various aptitudes and skills.

A. Kindergarten

The results of the data analysis for kindergarten are based on a three cell design as was mentioned in Chapter II. There are no subjects in Cell 2 (non-bussed, supported) since it was assumed that instructional support at this level would not be a critical issue. The results raise some question as to the legitimacy of that assumption. In summary form, the data can be reported as follows:

1. Cognitive Functioning
   Of the eleven measures used to evaluate change in cognitive functioning there is significant, systematic growth on five which is associated with suburban placement. For these five, Cell 4

(bussed and supported) is consistently significantly higher than the controls and in all but one instance higher than the Cell 3 subjects. Table 13 summarizes the results on the measures of cognitive functioning.

TABLE 13

Significant F - Ratios on Cognitive Functioning Measures

		Treatment	Sex	Treatment by Sex
WISC	Inf.	Non-sig.	Non-sign.	Non-sig.
	Comp.	Non-sig.	Non-sig.	Non-sig.
	Arith.	3.484*	Non-sig.	Non-sig.
	Simil.	Non-sig.	Non-sig.	Non-sig.
	Vocab.	Non-sig.	Non-sig.	3.692*
	IQ	Non-sig.	Non-sig.	Non-sig.
PMA	Verbal	Non-sig.	Non-sig.	Non-sig.
	Percep.	9.039**	Non-sig.	Non-sig.
	Quantit.	3.967*	Non-sig.	Non-sig.
	Motor	Non-sig.	Non-sig.	Non-sig.
	Spatial	12.654**	Non-sig.	Non-sig.

*Significant at .05 level
**Significant at .01 level

Study of this table indicates that major differences are found in the non-verbal functions more than in the verbal except in the area of vocabulary where males in Cell 4 (bussed and supported) show significantly greater growth. It is important to recall that in all instances the pre-test scores were used as covariate adjustors. This permits the inference that kindergarten subjects assigned to suburban schools with supportive teams have for one reason or another shown growth clearly in excess of the control groups on four cognitive measures and that boys assigned to such schools have shown similar growth on a fifth measure (Vocabulary). On no measure have experimental subjects done significantly less well than controls.

Subjects assigned to Cell 3 (bussed, but not supported) hold an intermediary position between Cell 1 and Cell 4. They excel both other groups on one measure (PMA Perception) and exceed the controls significantly (but do less well than Cell 4 subjects) on two other measures: PMA Quantitative and PMA Spatial.

2. School Skills

Of the seven measures (all subtests and the total score of the Metropolitan Readiness Test) used to assess development in school skills four show significant and systematic differences in favor of experimental subjects. Table 14 reports the significant F-Ratios and the sources to which they can be attributed.

TABLE 14

Significant F-Ratios on School Skill Measures

	Treatment	Sex	Treatment x Sex
Word Meaning	7.889**	Non-sig.	7.632**
Listening	25.226**	Non-sig.	Non-sig.
Matching	17.922**	Non-sig.	Non-sig.
Alphabet	Non-sig	7.474**	Non-sig.
Numbers	Non-sig	6.165**	Non-sig.
Copying	Non-sig	7.469**	Non-sig.
Total	16.133**	9.874**	Non-sig.

The results here parallel those reported for cognitive functioning. On all measures subjects in Cell 4 show the greatest gains and the major source for the significant differences in Word Meaning, Listening, Matching and Total Score is the treatment of suburban placement with supportive team. All 3 subjects do significantly better than controls on the Listening and Matching Tests, but less well than Cell 4 subjects. On Word Meaning they perform better than controls but not at a statistically significant level. On no measures do experimental subjects perform at a significantly lower level than controls.

Also illustrated in Table 14 is the influences of sex on learning school skills among this population. On three measures where there is no clear-cut association with treatment methodology there is clear evidence that females tend to do significantly better (these are measures named Alphabet, Numbers, and Copying). On Word Meaning where suburban placement by itself has a significantly positive impact on skill growth there is also a significant interaction effect between suburban placement (Cell 4) and sex (female). In other words, girls in Cell 4 tend to have even more enhanced growth. These findings in regard to sex tend to corroborate the oft-quoted statement that minority group females tend to function better in school than minority group males. This statement is the more appropriate in the light of the fact that none of the eleven measures of cognitive functioning was growth significantly related to being female.

3. Summary of Results on Kindergarten

Performance on nine of eighteen measures have been shown to be associated with placement in a suburban school with supportive assistance. On all but one of these, improved performance is independent of sex (on Vocabulary, males in Cell 4 contribute the significant source of change). On five of these eighteen measures significantly greater growth can be associated with placement in a suburban school without supportive assistance. On none of the measures did control subjects show growth significantly greater than that of the two experimental groups. This would seem to justify the tentative hypothesis that kindergarten youngsters will show greater growth in cognitive functioning and school skills when placed in suburban schools and that this growth will be further enhanced if such placement is accompanied by instructional supportive assistance.

A corollary finding is that females tend to achieve greater success in certain areas of skill (Alphabet, Numbers, Copying) than males regardless of treatment. In fact, these sex differences are found on measures where there are no significant associations with treatment.

B. Grade One

At grade one the four-cell design is in effect and allows for some study of the relative impact of compensatory assistance and urban-suburban mixing. Although some indications may be seen, it is important to stress again the problems associated with such inferences. The small N in Cell 3 and the restriction of this Cell to one school system are both limitations which must be kept in mind. The results at this grade level can be summarized as follows:

1. Cognitive Functioning

Of the eleven measures used to evaluate change in cognitive functioning six are significantly associated with treatment. The picture, however, is not a clear-cut one. On two of these six measures (PMA Quantitative and PMA Spatial) the experimental subjects significantly outscore the controls; on one measure (WISC Comprehension) control subjects perform significantly better than experimentals. On three other measures there is a mixed effect: on WISC Information and Verbal IQ there is a significant treatment effect with Cell 4 (bussed, supported) and Cell 1 (non-bussed, non-supported) having approximately equal impact upon positive change while Cells 2 and 3 have significantly less impact; on the PMA Perception subtest positive change is associated with Cell 1 (non-bussed, non-supported) and Cell 3 (bussed, non-supported). Table 15 indicates the significant associations on the measures of cognitive functioning.

TABLE 15

Significant F-Ratios on Cognitive Functioning Measures

		Treatment	Sex	Treatment x Sex
WISC	Inf	6.3577**	Non. sig.	3.6941*
	Comp.	5.2075**	Non. sig.	Non. sig.
	Arith.	Non. sig.	3.5718*	Non. sig.
	Simil.	Non. sig.	Non. sig.	Non. sig.
	Vocab.	Non. sig.	Non. sig.	Non. sig.
	IQ	3.7859*	Non. sig.	Non. sig.
PMA	Verbal	Non. sig.	3.4718*	Non. sig.
	Percept.	5.2374**	4.0989*	Non. sig.
	Quantit.	3.1747*	6.8975**	Non. sig.
	Motor	Non. sig.	Non. sig.	Non. sig.
	Spatial	2.9202*	Non. sig.	Non. sig.

*Significant at .05 level
**Significant at .01 level

This table also shows that sex is a significant factor on four measures and in each instance better performance is associated with being female.

2. School Skills

On the Metropolitan Readiness Test performance on three subtests is associated with treatment. Two of these (Word Meaning and Copying) show a significant positive association with being assigned to Cell 4 (bussed, supported) while one (numbers) indicates that Cell 1 (non-bussed, non-supported) is the most effective treatment procedure. The significant F-ratios are shown in Table 16.

TABLE 16

Significant F-Ratios on School Skill Measures

	Treatment	Sex	Treatment x Sex
Word Meaning	5.3350**	5.2214**	3.3421*
Listening	Non. sig.	Non. sig.	Non. sig.
Matching	Non. sig.	Non. sig.	Non. sig.
Alphabet	Non. sig.	4.7713*	Non. sig.
Numbers	3.4293*	3.2311*	Non. sig.
Copying	2.9981*	2.8319*	Non. sig.
Total	Non. sig.	Non. sig.	Non. sig.

Once again the significance of sex as a factor in performance is evident. In all four cases the advantage is with the females.

3. Summary of Results on Grade One

The picture about the differential impact of the various treatment procedures is somewhat clouded for Grade One subjects. The overall impression is that experimental subjects who receive supportive assistance perform somewhat better than other subjects. There are areas, however, where control subjects (non-bussed) outperform experimentals (WISC Comprehension often associated with "common sense" in its interpretation; and Metropolitan Numbers). It is difficult to discern a meaningful pattern across the significant differences; e.g., although controls do better on the Metropolitan Numbers subtest the experimentals outperform on the PMA Quantitative test. There are also areas where better performance is associated with one experimental cell (bussed, supported) and one control cell (non-bussed, non-supported). This raises the question as to what commonalty exists across these two cells since they differ on the dimension of support.

The issue of the relative effectiveness of supportive assistance certainly is not resolved in these data. While the experimental cell with support consistently outperforms the experimental cell without support, the opposite is true for controls where the non-supported cell consistently outscores the supported. This is a rather paradoxical finding which will need further analysis.

Once again the data point up the better functioning among the girls and at this grade level this is true on measures of cognitive functioning as well as measures of school skills.

Compared with the kindergarten results the first grade results are less striking and dramatic. Experimentals continue to have an edge, but the difference is not consistent nor is it of great magnitude.

C. Grade Two

Subjects at this grade level had the least amount of standardized testing of any of the six grades. This is the result of the testing being restricted to the cognitive functioning measures and no tests of school skills being administered. The four cell design is utilized here as at Grade One and as in the subsequent grades.

1. Cognitive Functioning

Significant differences related to treatment cells are found on six of the eleven measures of cognitive functioning. The striking aspect of these results is that all significantly higher scores are associated with cells which have supportive services. There is not a clear picture of superiority of urban versus suburban placement across these measures although on two measures (PMA Quantitative and PMA Motor) the enhanced scores are particularly associated with Cell 2 (non-bussed, supported) while on the other four measures (WISC Similarities, PMA Verbal, PMA Perceptual, PMA Spatial) Cell 4 and Cell 2 are both equally associated with significant improvement over the subjects in Cells 1 and 3 (both of which are non-supported). Table 17 summarizes the significant relationships.

TABLE 17

Significant F-Ratios on Cognitive Functioning Measures

		Treatment	Sex	Treatment x Sex
WISC	Inf.	Non. sig.	Non. sig.	Non. sig.
	Comp.	Non. sig.	Non. sig.	Non. sig.
	Arith.	Non. sig.	Non. sig.	Non. sig.
	Simil.	2.7967*	Non. sig.	Non. sig.
	Vocab.	Non. sig.	4.5426*	Non. sig.
	IQ	Non. sig.	2.9932*	Non. sig.
PMA	Verbal	15.0540**	4.8939*	8.1231**
	Percept.	9.6983**	Non. sig.	5.7718**
	Quant.	3.8456*	Non. sig.	Non. sig.
	Motor	5.0083**	Non. sig.	Non. sig.
	Spatial	4.8784**	Non. sig.	Non. sig.

*Significant at .05 level
**Significant at .01 level

Again sex shows up as a determining element but in contrast with the two earlier grades the advantage here falls to the boys on three (WISC Vocabulary, WISC IQ, and PMA Verbal) of the four measures. On the fourth measure (PMA Perceptual) girls outscore boys. This shift is difficult to explain from the data but appears to be the beginning of a trend found in the later grades as well. The early superiority of the female on these measures disappears at this grade level and is not found to be consistent in subsequent grades.

2. Summary of Grade Two Results

Three statements appear to summarize the results of this level:

a) Enhanced performance is related to placement in a cell which includes supportive assistance on six of the eleven measures of cognitive functioning.
b) The differences between Cell 2 and 4 are slight although on two measures Cell 2 subjects do significantly better.
c) Males do significantly better than females on two of the three measures where sex is significantly related to performance.

Since these statements state the results in capsule form it is obvious at this grade level that the impact of suburban placement as a treatment procedure of choice has not been clearly demonstrated.

D. Grade Three

With Grade three the four cell design with measures of both cognitive functioning and school skills is again employed. At this grade and in the two subsequent grades the school skill measures are three subtests of the Iowa Tests of Basic Skills (Vocabulary, Reading, Arithmetic Computation).

1. Cognitive Functioning

On five of the eleven subtests there is a significant relationship between treatment and performance. On all of these six measures Cell 4 (bussed, supported) is the major source of the association. However on two measures (WISC Similarities and WISC Vocabulary) there is also a significant association with Cell 2 (non-bussed, supported) and on two other measures (PMA Verbal and PMA Quantitative) Cell 3 (bussed, non-supported) shows a significant relationship. Table 18 indicates the significant associations.

TABLE 18

Significant F-Ratios on Cognitive Functioning Measures

	Treatment	Sex	Treatment x Sex
WISC Inf	Non. sig.	10.0799**	Non. sig.
Comp.	Non. sig.	Non. sig.	Non. sig.
Arith.	Non. sig.	4.6267*	Non. sig.
Simil.	10.5619**	4.5850*	3.0136*
Vocab.	Non. sig.	4.7699*	2.6138*
IQ	Non. sig.	7.0500**	2.6405*
PMA Verbal	6.5299**	17.9690**	Non. sig.
Spatial	Non. sig.	Non. sig.	Non. sig.
Reasoning	Non. sig.	Non. sig.	Non. sig.
Percept.	Non. sig.	Non. sig.	Non. sig.
Numerical	3.8066*	Non. sig.	Non. sig.

*Significant at .05 level
**Significant at .01 level

Study of the table shows that treatment by itself contributes the significant variance on only three of the six measures; on the other three it is treatment interacting with sex which results in the difference. Interestingly on all three such measures it is interaction with maleness which brings about enhanced results. In fact, Table 18 indicates that sex is a significant factor on six measures and on all six the males outperform the females.

2. School Skills

There is less variability across these measures. In fact only two significant associations are discovered. Cell 4 (bussed, supported) shows a significant association with higher Reading scores which maleness is related to higher Arithmetic scores. Table 19 illustrates these findings.

TABLE 19

Significant F-Ratios on School Skill Measures

	Treatment	Sex	Treatment x Sex
Vocab.	Non. sig.	Non. sig.	Non. sig.
Read	3.0886*	Non. sig.	Non. sig.
Arith.	Non. sig.	7.6301**	Non. sig.

*Significant at .05 level
**Significant at .01 level

3. Summary of Grade Three Results

The following tentative conclusions seem justified by the data for Grade Three subjects:

a) Subjects assigned to Cell 4 (bussed, supported) have a definite advantage across the cognitive functioning measures and also do significantly better on the reading test.
b) Subjects who are bussed without supportive assistance (Cell 3) and subjects receiving supportive assistance but not bussed (Cell 2) do about equally well, but do less well than Cell 4 subjects and better than Cell 1 subjects.
c) Boys tend to show more growth than girls on these measures and in three instances there is evidence that boys benefit more (as measured by these instruments) from suburban placement than girls; put another way, placement in a suburban school appears to have a more differentiating effect upon boys than upon girls.
d) For the subjects at this grade level suburban placement with supportive services is clearly the most effective educational treatment.

B. Fourth Grade Results

The fourth grade presents a serious problem of interpretation because an inordinate number of the missing test scores occur in the two control groups. In fact, of the total N of 55 assigned to these two cells better than 50% of the data is missing on some measures. This problem has been mentioned in the previous chapter. Nonetheless, the same methodology has been employed here as at other grade levels in spite of the fact that some of the lacunae at grade 4 are twice the size of those at any other grade level.

The data for the experimental groups at this level is especially complete. On no measure does the percentage of missing information exceed 10%.

1. Cognitive Functioning

On six of the eleven measures of cognitive functioning there is evidence of statistically significant association between improved scores and treatment. However, the direction of the results are difficult to interpret. On three WISC measures (Information, Arithmetic, and Verbal IQ) improvement is most clearly associated with placement in Cell 1 (unbussed and unsupported) and secondarily with Cell 4 (bussed and supported). On one of these measures (Information) the difference between these two cells is non-significant; thus, the association with growth can be considered equivalent across these two. On the other two measures (Arithmetic and Verbal IQ) Cell 1 is significantly more improved than Cell 4 which in turn does better than the other two cells.

In spite of the reservations occasioned by the missing data the significant F-ratios on the eleven measures are presented in Table 20. There is one aspect of these figures which can be mentioned without concern about inflated post-test scores. On all measures where there is significant treatment effect Cell 4 subjects excel Cell 3 subjects. Here again, however, the small N in Cell 3 requires cautious interpretation.

TABLE 20

Significant F-Ratios on Cognitive Functioning Measures

		Treatment	Sex	Treatment x Sex
WISC	Inf	12.802**	Non. sig.	Non. sig.
	Comp	3.384*	5.769**	Non. sig.
	Arith	21.001**	Non. sig.	Non. sig.
	Simil	Non. sig.	Non. sig.	Non. sig.
	Vocab	Non. sig.	Non. sig.	Non. sig.
	IQ	13.434**	Non. sig.	Non. sig.
PMA	Verbal	Non. sig.	3.673*	Non. sig.
	Spatial	Non. sig.	Non. sig.	Non. sig.
	Reasoning	Non. sig.	Non. sig.	6.615**
	Perception	3.983*	3.526*	3.770*
	Numerical	Non. sig.	7.467**	Non. sig.

*Significant at .05 level
**Significant at .01 level

The reservations expressed about the WISC cannot be applied so stringently to the PMA. Treatment is a significant factor in change in scores on Perception with Cell 2 and Cell 1 contributing major and equal impact; Cell 4 less impact but considerably more so than Cell 3. On four measures sex accounts for a major source of the variance (PMA Verbal, Perception, and Numerical; WISC Comprehension) and in all cases it indicates a positive association with female. The two instances of significant interaction between sex and treatment as being associated with growth again emphasize the advantage of being female and being assigned to Cell 2.

2. School skills

Although the data on the Iowa Test of Basic Skills are reasonably complete for all four cells a serious problem has been created by the use of what may be a spuriously deflated covariate adjustor. This would result in inflation of the impact which Cells 1 and 2 have upon the achievement scores and, in fact, the results are consistent with such a hypothesis. Table 21 indicates the significant F-Ratios for the school skills measures.

TABLE 21

Significant F-Ratios on School Skill Measures

	Treatment	Sex	Treatment by Sex
Vocabulary	Non. sig.	5.212*	Non. sig.
Reading	5.985**	Non. sig.	Non. sig.
Arithmetic	7.356**	Non. sig.	Non. sig.

Enhanced performance in Reading and Arithmetic is associated significantly with treatment and Cell 1 is the source of major improvement with Cell 4 the second best contributor. However, it must be emphasized that the use of a deflated adjustment score would have the effect of exaggerating the impact of Cell 1.

3. Summary of Grade 4

The results for grade 4 must await next year's evaluation for some clear-cut answers. The data on first impression indicate that youngsters remaining in the inner city without supportive assistance show most development in cognitive functioning and school skills. The possibility that this is a function of the statistical manipulation described in Chapter II must be carefully examined in the second year; unfortunately there are no adequate data to test this possibility at this point.

However, two things do appear reasonably certain. The tendency for female subjects to gain more from any of the treatment cells than males is pronounced in both measures of cognitive functioning and in school achievement. This is a change from kindergarten where the difference was found in school skill measures but not on cognitive functioning measures. Also, even with the very small N the consistently lower performance of Cell 3 in relation to Cell 4 stands out, suggesting that suburban placement with supportive assistance does increase the impact of that treatment.

f. Grade Five

Grade 5 presents the greatest challenge to the suburban intervention hypothesis. Even among the supporters of the original concept there were many who questioned whether it would be possible to stem - much less reverse - the "cumulative deficit" phenomenon at so late a stage of school development. Studies on achievement and intelligence patterns summarized so succinctly by Bloom (1964) suggest that such patterns are relatively crystallized by grade 4. Fortunately, at this grade level the data in all four cells are reasonably complete to permit a basis for study and interpretation.

I. Cognitive Functioning

On the eleven measures of cognitive functioning treatment accounts for a significant proportion of the variance on four. On three of these four (WISC Vocabulary; WISC Verbal IQ; PMA Reasoning) Cell 4 has the greatest impact upon development with Cell 2 having a significantly greater impact than either 1 or 3 on Vocabulary development and IQ. On the fourth measure (PMA Numerical) Cell 1 has the greatest effect. On other measures treatment is as not a significant factor and, as Table 21 indicates the impact of sex as a critical variable is less pronounced than at Grade 4. In fact, not only is the effect less pronounced, but the direction is now reversed with positive development being significantly associated with male-ness on two measures.

TABLE 22

Significant F-Ratios for Cognitive Functioning Measures

		Treatment	Sex	Treatment x Sex
WISC	Inf	Non. sig.	Non. sig.	Non. sig.
	Comp.	Non. sig.	Non. sig.	Non. sig.
	Arith.	Non. sig.	Non. sig.	Non. sig.
	Simil.	Non. sig.	Non. sig.	Non. sig.
	Vocab.	3.347*	Non. sig.	Non. sig.
	IQ	2.783*	Non. sig.	Non. sig.
PMA	Verbal	Non. sig.	Non. sig.	Non. sig.
	Spatial	Non. sig.	Non. sig.	Non. sig.
	Reasoning	6.853**	3.914*	Non. sig.
	Perception	Non. sig.	19.177**	Non. sig.
	Numerical	9.170**	9.806**	Non. sig.

*Significant at .05 level
**Significant at .01 level

The only exception to this is the PMA Perception subtest where the scores are highly influenced by the female factor.

2. School Skills

The analyses of the variance on the three subtests of the Iowa Test of Basic Skills show a quite different picture from the cognitive functioning measures. Treatment is a significant source of variance on the Vocabulary Subtest with the Cell 1 having the greatest positive impact. In addition treatment interacts with sex (male) as a significant source with Treatment Cell 1 most effective followed by Treatment Cell 4. Table 23 summarizes the significant F-Ratios.

TABLE 23

Significant F-Ratios for School Skills Measures

	Treatment	Sex	Treatment x Sex
Vocabulary	5.221**	Non. sig.	3.747*
Reading	Non. sig.	6.592**	Non. sig.
Arithmetic	Non. sig.	Non. sig.	6.830**

*Significant at .05 level
**Significant at .01 level

These data tend to suggest that school skills measures when assessed after being covaried with pre-test WISC IQ's are more influenced by inner city school placement than by suburban school placement and that this is especially true of males. However, the lack of correlation between these measures and the covariate adjustor must be considered also.

3. Summary of Grade 5 Results

This interim report could not be expected to answer the basic question about the potential for stimulation toward educational development which the experimental treatments have for fifth graders. The data do, however, present some tentative, but tantalizing results. These are:

a) Fifth graders placed in a suburban school with supportive assistance have show significantly greater improvement in WISC Vocabulary, Verbal IQ and PMA reasoning Tests than have youngsters assigned to the other three cells.

b) Fifth graders placed in inner city schools without supportive assistance show higher scores (covaried with pre-test IQ) on achievement measures of vocabulary and arithmetic.

c) Sex has a prominent effect upon growth in some areas: girls do systematically better on the Reading subtest while boys do systematically better on the PMA Reasoning and Numerical subtests.

d) The influence of the supportive team as differentiated from the placement is difficult to discern. Clearly, suburban placement with support is the most effective treatment model on these measures. When Cell 2 (non-bussed, supported) is compared with Cell 3 (bussed, non-suppported) no clear pattern emerges. On two measures of cognitive functioning Cell 2 appears as a second-choice treatment; on the other two measures Cell 3 assumes this position while Cell 2 slips below Cell 1. The problem of interpretation is, of course, exaggerated by the extremely small N's (16 and 5 respectively) in these two cells.

e) A tentative inference from these data would hold that at this grade level measures of global aptitudes tend to be significantly and positively effected by suburban placement while measures of specific skills are not so effected.

G. Summary of Chapter Three

The grade by grade analysis indicates the lack of consistency in the results but it may also obscure the rather pronounced differences across the four cells. When all six grades are combined the picture is one which suggests, within the very real limitations of these data and within the limited time period, that suburban placement with supportive assistance is the most effective educational intervention. Again, it is important to stress the tentativeness of that statement particularly for the following reasons:

1) possibility of distortion because of missing data;
2) small number of subjects assigned to Cell 3;
3) possibility of uncontrolled variables (e.g., "Hawthorne effect"; school system; etc.) contributing to the results.

At the same time it is necessary to underline the fact that these same conditions could operate to the disadvantage of the experimental group as could the shortness of time (one school year) on measures which have not been shown to be particularly sensitive to change.

Nonetheless, Table 24 gives some idea of the variation among the four cells in terms of significant positive effect upon performance. This table along with the data presented in the body of the chapter allows the following tentative conclusions:

TABLE 24

Total Number of Significant Relationships by Cell

	Cell 1	Cell 2	Cell 3	Cell 4
Cognitive Func.	8	8	4	19
School Skills	5	-	-	9

1) Placement in a suburban school with supportive assistance is the most effective treatment for improving scores on tests of cognitive functioning. In these data a significant effect is found on 19 out of 66 measures or on roughly 30%; the next closest treatment (Cells 1 and 2) are significantly associated with improvement on 12% of the measures.
2) This effect is most pronounced in kindergarten, grade one, grade three and grade five. It does not appear at grade four at all and at grade two supportive assistance appears a more potent variable than suburban placement.
3) Placement in a suburban school with supportive assistance is also the most effective treatment for enhancement of scores on measures of school skills. On 9 out of 23 possible measures (39%) this intervention has significant impact. It appears that this impact is stronger in the earlier grades.
4) At only one grade level does supportive assistance within the city seem to be an important factor (Grade 2). At all other grades control youngsters perform at about the same level in both supported and non-supported cells.
5) Suburban placement without supportive assistance appears to be the least effective treatment method. However, the extreme tentativeness of this statement must be emphasized. The reasons for this caution have been mentioned several times within the text.
6) Sex appears as a significant factor in the results, but in an inconsistent way. In the early grades girls tend to score better while in grades 2 and 3 the advantage shifts to the boys. At grade levels four and five there is more of a mixed situation. There does appear, however, to be some inclination for suburban placed boys to perform better in the upper grades (3-5) and it may be that such placement will prove to have a more potent effect upon the performance of boys than of girls.
7) A final conclusion is in conflict with the literature. All cells at all grade levels showed either improvement or no loss. This is in contrast to the "cumulative deficit theory" which holds that inner city children should fall further behind (in terms of test norms) the longer they remain in school.

CHAPTER IV

Related Findings

The previous chapter has presented an analysis of the impact of the four treatment models on measures of cognitive functioning and school skills. There are, however, a number of other areas which deserve comment and can add flesh to the skeleton set forth in Chapter III. These related areas are quickly summarized in the following pages:

DROPOUTS

Since parental permission was needed to include an experimental subject in the study it was also possible for a child to be withdrawn. The total number of children withdrawn over the year was 15. The bases for withdrawals are listed below:

Inconvenience to parent	5
Moved from Hartford	3
Behavioral problems	2
Emotionally upset	5

Although this drop-out figure represents 6% of the population it is less striking when the following items are considered:

1) all children withdrawn because of "inconvenience to parents" were kindergarten and first graders removed during the month of September;
2) two of the emotionally upset were also removed in September.

This results in a drop-out figure of 5 youngsters after October 1 if these subjects who moved from Hartford are excluded. This would be less than 2% of the total group.

FAMILY CHARACTERISTICS

The collection and analysis of data about the families are incomplete. However, certain figures are available to help define the population from which the pupils were drawn:

54% of the homes lack either a father or stepfather
66% of the families receive welfare assistance

These figures, limited as they are, do suggest that Project Concern is involved with the "urban poor" as they have been described in the recent literature and that the results of the study should have meaning for areas with similar characteristics.

The final report will contain much more detailed demographic data about the "North End" and about the families.

ANXIETY LEVEL

The Sarason Test Anxiety Scales and General Anxiety Scales were administered on a pre- and post-basis to experimental and control subjects in grades 1-5. Here again detailed analysis is incomplete. However, some preliminary data can be reported:

1) Boys tend to have higher anxiety scores than girls and this is particularly pronounced on the General Anxiety Scale.
2) Anxiety scores on both measures tend to decrease from pre to post testing and show no significant relationship with age or grade.
3) Pre-test Text Anxiety Scale scores are related significantly and negatively to all but one (Comprehension) subtest score and total IQ on the post-testing on the WISC. Although the relationship is statistically significant in no instance does it exceed .30.
4) On preliminary analysis there appear to be no significant differences among the four cells.

ATTENDANCE

The attendance figures for the various cells show some small deviations. These do not reflect the entire picture, but they do show that attenance which is dependent upon meeting a bus schedule and waiting for a bus under sometimes inclement conditions has not resulted in increased absence.

Cell 1 Mean number of days absent	18.4
Cell 2 Mean number of days absent	12.6
Cell 3 Mean number of days absent	17.4
Cell 4 Mean number of days absent	14.8

These mean scores do obscure the fact that both of the experimental cells have a higher percentage of seriously chronic absentees. This suggests the importance of careful attention to absenteeism and the need for continuous liaison with the homes.

PARENTAL INVOLVEMENT

It is difficult to assess the true extent of parental involvement. At this time for the interim report it will be sufficient to indicate that 92% of the families took part in school related activities in the suburbs.

AFTER SCHOOL ACTIVITIES

Project youngsters took part in several kinds of extracurricular activities in the suburbs. These included scouting, athletics, clubs, and play at the homes of suburban schoolmates. These activities required late bus service to all five communities and over 70% of the Project youngsters participated to some degree in these programs.

TEACHER REPORTS AND PERCEPTION

A rather sophisticated analysis of the weekly teacher ancedotal records will be incorporated into the final report. This analysis is still in the developmental stage and, as a result, this interim report attempts to give a flavor of what may come by selecting a random sample of 50 youngsters and comparing the teacher comments through November with the comments in May and June. The comments were categorized into positive, negative and neutral and also into three areas: academic performance, classroom attitude, school behavior. On the basis of this sample significant shifts toward more positive responses are found in the school behavior and academic performance areas; the same trend exists for classroom attitude although it does not reach the .05 level of statistical significance.

CHAPTER V

A Look To The Past and To The Future

Many of the myths so vehemently stated when Project Concern was an idea striving to be born have evaporated. There have been no signs of physical or psychological trauma; attendance has been good, motivation high, and cooperation excellent. Parents at both ends of the bus ride have displayed an interest and concern that has demonstrated the human experience which lies at the heart of this educational experiment. Yet beyond the myths are the real and significant questions; some of these have been studied in Chapters III and IV but three others demand at least passing comment even in a preliminary, interim report. These are:

1) some speculation about the theoretical assumptions presented on Page 5;
2) some analysis of the homogeneity of the impact of the five different suburban school systems;
3) some indication of the areas which remain to be explored.

Theoretical Rationale

Two basic assumptions were stated in Chapter I as underlying the operational design of Project Concern. The direct evidence for the hypotheses is lacking and is probably beyond the scope of the data collection design as it has been presented. However, as an adjunct activity a randomized sampling of classes in the city and in the suburbs was selected and trained observers placed in them. These observers recorded the behaviors of both teachers and pupils in the classrooms and categorization of these behaviors is still in process. Nonetheless, some subjective interpretations would permit two conclusions:

1) there is a distinct difference in classroom climate from the suburban school to the inner city school;
2) this difference is reflected in the modes of behaviors which both teachers and pupils show.

Beyond this there are two other indications, both at the level of suggestion rather than fact, which substantiate the theoretical position. One is the change in reported teacher perception maintained in Chapter IV: suburban teachers report that the behavioral patterns of experimental youngsters are modified in the direction of suburban school expectations. The other indicator is a comparison of the anecdotal records of the experimental youngsters prior to the program's inception with school records in the suburbs. There is a dramatic decrease in references to antisocial and antischool behaviors which are probably best explained by the contribution which environmental pressure makes upon overt behavior rather than by profound dangers in personality dynamics.

Homogeneity of Suburban School Influence

As might well be expected the impact of suburban school placement is not a constant with similar influence upon all subjects at all grade levels. As sex was shown to be an important variable in many of the results presented in Chapter III there is also considerable evidence that school systems have a differentiating effect - and that this effect varies from grade level to grade level (whether as a function of differences in school operations or as a function of the subjects assigned goes beyond the present data). The available results are especially tentative because of the choice of criterion variables upon which to begin the analysis (WISC IQ; PMA Verbal; Metropolitan Total; Iowa Reading). Nonetheless, even these introductory explorations open up avenues for serious consideration. Of particular importance is the issue of what are the characteristics of a school or school system that make it an especially potent intervention for a given group of youngsters. This requires, of course, analytical observation of the school as a social institution as well as a comprehensive study of the youngsters assigned to that school.

The related problem which has been left unmentioned in this report but which is central to a total view of the experiment has to do with a critical look at those youngsters who have clearly not responded to the treatment methodologies. This study ought to be made across all four treatment conditions in the quest of the technique or techniques. It may well be that there will be a core of youngsters identifiable in terms of a profile of characteristics, which does not seem to be positively effected by any of the four treatments. The incidence of this pattern if found, across the four treatments and across the various school systems must be a consideration in the interpretation of inter-school differences.

Still, these data do provide a unique opportunity for sketching the dimensions of an educational program and the increased emphasis on classroom observation and categorization, of interactions may provide some initial insights into the complex questions about the teaching-learning process. At this point the available data underline the considerable variability of impact upon score enhancement across the five participating towns. It goes without saying that any such data can be at best suggestive and indicative. The small numbers involved at each grade level could hardly result in stable findings. In spite of these limitations there are sufficiently large differences to warrant some exploration into three questions:

1) how do the classroom methods differ from town to town;
2) how do the youngsters assigned vary from town to town;
3) how do teacher attitudes and expectations vary from town to town.

Hopefully, some answers to these questions may be available for the final report. In any event, it is clear that the axiom of individual difference must be broadly applied across a series of characteristics and that an interaction model which sees behavior as a function of the dynamic qualities of both individual and environment is far more closely related to the data than an assumption of a static, mechanistic environment having a constant effect upon varying individuals.

Unanswered Questions

The final report will expand upon all of the items covered in Chapters III, IV, and V while it also attempts to clarify some of the cloudier results. At the same time it will present data on a number of issues which have not been presented in this interim report. They are as follows:

1) influence of urban children upon the academic achievement of suburban children;
2) attitudes of suburban parents toward suburban education of inner city children;
3) social interaction between suburban and urban children in the school classroom and on the playground;
4) attitude of urban children and parents to suburban education;
5) social interaction between urban children who are bussed and those who are not.

The failure to include these areas in the interim report does not indicate that they are of secondary importance; rather, it suggests the magnitude of the data collection and analysis process combined with the pressing need to make some of the results available for further study.

CHAPTER VI

Inservice Training

Project Concern, as a unique exploration into the possibilities for educational development among those who have traditionally been deprived equal educational opportunities, is in actuality a total on-going, inservice experience. The results presented in the preceding pages make up the major thrust of the inservice program and starkly illustrate the significance of a desegregated school experience on the behaviors of minority group children and families. These results carry a message which can be interpreted within the framework of local needs and conditions for new programs and efforts. In this fashion, this report, even within its limitations, can serve as a case study of a meaningful laboratory experience as this in reality makes up a learning situation for professional educators, civic leaders, parents (both inner city and suburban) and laymen generally.

Although the total program - and particularly its research aspect - constitutes the heart of the inservice training, a number of formal in-service experiences were initiated as part of the on-going program. These were directed toward several goals:

1) Increased sensitivity and skills for educators
2) Increased involvement for parents
3) Inreased awareness and more factual information for the general public.

To document in detail these efforts would be to stress the obvious. Rather, in this report the following few paragraphs will sketch the extent and orientation of the formal program.

A. Individual Consultation with Teachers

The Central Office staff of Project Concern had individual contacts with teachers, principals and other school personnel which amounted to 1987 meetings. The focus of these sessions were support, communication, and cooperative planning. These are viewed as the backbone of the formal inservice program.

B. Semi-Monthly Meetings with Supportive Teams

There were two meetings each month with the supportive teachers and aides who were supplied to the cooperating school districts. These meetings were problem-centered and resulted in policy modifications as well as more effective coping with the many and unending issues which surround a pioneer program in desegregation which also involves urban-suburban collaboration.

C. Formal Workshops and Institutes

Project Concern served as the sponsor or focus for a series of workshops and institutes during the year. These are listed below:

Summer, 1966 - 6 week preparation for teachers, administrators, and aides.
December, 1966 - one day institute for all teachers (130) with emphasis on sharing of experiences.
March, 1967 - 2 day national invitational institute for school administrators.
April, 1967 - one day workshop for teachers for planning (120 in attendance).
May, 1967 - one day parent workshop for program evaluation
July, 1967 - one week training program for aides
August, 1967 - 3 day parent institute with emphasis on child needs and home-school communication.

D. Advisory Meetings with School and Community Leaders

Throughout the year there were regular meetings with superintendents and coordinators of schools, with a broadly-based advisory committee, with a carefully selected group of advisors, and with business, civic and civil liberties groups.

E. Public Relations and Information

During the academic year 1966-67 the Director and Assistant Director spoke to over 130 groups in the central Connecticut area. This involvement was particularly directed to providing information and stimulating interest. At the same time a number of officials in the participating schools also had heavy speaking loads to describe their experiences.

F. Related Activities

In addition the program received continuous and positive coverage from daily newspapers, local television and radio stations. These were the result of efforts to provide frank and open communication in all possible ways. Also, there was active participation in the 1967 session of the Connecticut General Assembly which resulted in passage of a bill which encourages and partially subsidizes similar programs.

This brief outline attempts to describe the nature of the formal inservice program; the impact of this effort is best seen in the preceding pages and in the continuing support which is evident in the increasing requests from parents for participation in the program.

CHAPTER VII

Summary, Conclusions, and Limitations

This interim report has covered a number of areas while it leaves others untouched. The fact that this is a tentative and preliminary report cannot be overemphasized nor can the intrinsic limitations of the data. These limitations are restated here so that interpretations and inferences will be made with full awareness of the dangers involved. Basically, they are as follows:

1) The most fundamental limitation is a function of the missing data. Unfortunately the data collection process as it was carried out by an independent agency failed to include adequate checks and controls. This has been discussed in Chapter II where Table 6 clearly illustrates the extent of the problem which is most prominent in grade 4. In an effort to estimate the value for the missing items the mean for that cell, for that sex at that grade level was used. This enhanced the accuracy and stability of the results. Logically defensible compensations were introduced in setting the significance levels at a more stringent standard but the procedure still may have resulted in distortions which cannot be known.
2) Another very serious limitation had to do with the extremely small size of the sample in Cell 3 (bussed, non-supported). This fact, combined with the fact that all Cell 3 subjects are in one town, poses serious problems for conclusive interpretations.
3) Related, though seemingly less serious is the question as to whether or not the compensatory services provided for Cell 2 subjects are identical with those provided for Cell 4.
4) The last limitation to be mentioned here is the issue about the potential impact in so short a time. On the one hand it is possible that there will be an exaggerated effect as a function of change ("Hawthorne effect"); on the other hand, it is possible that aptitude and achievement measures will not reflect important changes in attitude and motivation which may precede changes in performance.

All of these are items which place a heavy burden on the statistical analysis. Nonetheless, a number of tentative conclusions seem warranted although each of them will require corroboration from subsequent data. These conclusions can be summarized as follows:

1) Youngsters who were placed in suburban schools and received supportive assistance clearly out performed the subjects in the other three treatments. The differences are statistically significant and are found across the full range of grades. However, there are inconsistencies in the results and the differences, although encouraging, are not miraculous.
2) There is no evidence in these data to show that supportive assistance within the inner city results in more enhanced learning than regular school placement in the inner city. This conclusion however, may be somewhat misleading because of the heavy investment in compensatory programs in all inner city schools in Hartford by way of Title I, ESEA, and State Act for Disadvantaged Children funds.
3) Suburban placement without supportive assistance, within the limitations of the present data, is not a more effective treatment method than regular inner city placement. This conclusion must be taken as highly tentative for reasons discussed above.
4) Youngsters transported to suburban schools tend to persist in their school placement, attend regularly, and take part in extra-curricular activities.
5) Suburban teachers report that bussed youngsters fit in well, adjust quickly, and respond positively to high academic expectations.
6) There are no signs among experimental subjects of increased anxiety, of higher incidence of emotional or behavioral problems, or of greater school failure.
7) There are no signs that suburban teachers experience unique difficulties in the educational stimulation or classroom management of inner city youngsters.
8) Inner city parents apparently are receptive to the concept of suburban education and respond to inclusion in the program by increased participation in school activities.
9) Sex differences in performance are frequently found in the data, but they are inconsistent. At the early grades, girls outperform boys while this trend is reversed in the middle grades. A possible explanation for this may be that suburban placement tends to prevent the oft-noted academic slump of the eight to ten year old boy but this hypothesis needs further study.

10) None of the four treatment methods resulted in a decrease in performance. This failure to find the "cumulative deficit phenomenon" may be a reflection of the intensified efforts within the inner city schools. Even with this, youngsters in Cell 4 have a definite and significant advantage.

In sum, the phrase "it seems to work" is appropriate. There can be no question that the results are encouraging in terms of the original hypothesis and, if they fall short of the miracle stage, they are still such as to give courage and conviction to those who dream of implementing immediately programs leading to equal educational opportunities for all. The real test lies ahead and the report to be issued in August, 1968, should be able to evaluate with a definitiveness which would now be misleading the effectiveness of suburban school placement for inner city children. Yet it would be equally rash to ignore these results and to put them aside because of their limitations. They present a picture which deserves to be viewed and studied by both advocates and opponents as well as by those who have remained neutral. Their direction is clear; the question which remains is whether this direction will become more dramatically evident, will be maintained, or will fade. Only time and careful, rigorous data collection will answer that question.

APPENDIX A

Adjusted Means for Criterion Variables with Significant Treatment Effects

1. Kindergarten

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Arith	3.484	3.481	-	2.927	4.044
WISC Vocab	10.646	10.658	-	9.471	11.809
PMA Percept	13.776	9.404	-	17.008	14.916
PMA Quant	11.981	9.697	-	12.751	13.495
PMA Spatial	7.940	4.622	-	9.050	10.148
Met. Word	5.981	5.087	-	6.131	6.725
Met. Listening	8.779	6.811	-	9.317	10.209
Met. Matching	6.246	4.019	-	7.413	7.306
Met. Total	41.686	33.135	-	42.872	49.051

2. Grade 1

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Inf.	7.2313	7.6326	6.4387	7.2019	7.5520
WISC Comp.	7.3835	9.0297	6.8942	6.4079	7.2022
WISC IQ	95.0419	99.1940	92.2090	91.5626	98.7020
PMA Percep.	24.1241	26.0389	22.2109	25.4027	22.8439
PMA Quant.	18.7143	19.1867	18.5863	16.9508	20.1334
PMA Spatial	17.1035	16.3362	13.1186	20.0114	19.9478
Metr. Word Meaning	8.5747	6.6615	7.4693	7.5168	12.6512
Metr. Numbers	15.1106	17.0847	15.0950	14.3065	13.9462
Metr. Copying	8.1466	7.9003	5.6673	7.4159	11.6029

3. Grade 2

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Simil	7.3360	6.1333	8.7280	6.7585	7.7242
PMA Verbal	42.0251	42.4831	44.5583	37.3126	43.6464
PMA Percep.	26.1774	25.7600	28.4223	23.3449	27.1824
PMA Quant.	22.1325	22.5099	23.8021	20.1722	22.2192
PMA Motor	38.1810	34.6594	47.6220	33.7047	39.6259
PMA Spatial	16.4527	16.8723	18.1389	12.2703	18.5243

4. Grade 3

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Simil	8.3921	7.2080	9.7641	7.1830	9.4133
PMA Verbal	26.9281	24.2008	23.6221	29.9069	30.0826
PMA Numerical	21.1053	18.8367	20.7400	23.2944	21.7501
Iowa Read	18.0055	20.7999	16.8146	11.2736	24.1339

5. Grade 4*

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Int.	11.583	12.835	9.445	11.664	12.388
WISC Comp.	10.917	11.827	11.876	9.247	11.116
WISC Arith.	7.925	9.503	7.636	6.670	7.959
WISC VIQ	94.836	104.470	94.342	85.885	94.647
PMA Percept.	27.461	30.500	30.830	21.925	26.489
Iowa Reading	33.212	38.237	31.981	30.056	32.574
Iowa Arith.	35.337	40.441	32.034	32.703	36.270

*Cf text, Chapter III, for discussion of probability of spurious inflation of Cell 1 and Cell 2 values.

6. Grade 5

Variable	Grand Mean	Adjusted Means			
		Cell 1	Cell 2	Cell 3	Cell 4
WISC Vocab	27.788	27.403	30.671	22.726	30.352
WISC IQ	89.359	89.565	92.069	82.589	93.213
PMA Reas	21.794	22.632	15.897	22.762	25.885
PMA Num.	47.391	52.795	44.538	45.477	46.754
Iowa Vocab	47.391	52.539	46.183	44.934	45.908
Iowa Arith	43.858	46.024	44.081	41.080	44.247

END

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